REMARKS

Claims 1, 2, 5-7 and 10-12 are pending in the application. The Office has now examined claims 1, 2, 5-7 and 10-12 and rejected same, as described below. Claim 12 is amended, and all other claims are unamended.

Claim Objections

Applicant amends claim 12 to now read "**an** apparatus" instead of "**the** apparatus," which overcomes the objection based on lack of antecedent basis.

Independent Claims 1, 6 and 11 are Patentable Over Gronemeyer

At paragraph 5 of the Office action, all the independent claims of the application, namely claims 1, 6 and 11, are rejected under 35 USC § 103 as being unpatentable over U.S. Pat. No. 6,577,271 to Gronemeyer. The reasons for rejection of claim 1 are similarly applied in the rejection of claims 6 and 11. Dependent claims 5 and 10 are additionally rejected under 35 USC § 103 as being unpatentable over Gronemeyer in view of U.S. Pat. Appl. No. 2001/0005402 to Nagatani.

As to claims 1, 6 and 11, applicant respectfully submits that the assertions of the Office action notwithstanding, Gronemeyer does not in fact teach the limitations recited in claim 1. The Office action acknowledges that Gronemeyer does not explicitly disclose a step of performing non-coherent integration that includes multiplying each element of a matrix of correlation results by the complex conjugate of a corresponding element for an immediately proceding signal fragment. The Office action asserts that the method of finding the correlation result disclosed by Gronemeyer is functionally and mathematically equivalent to the method of claim 1. It is respectfully submitted that this

assertion is incorrect. In Gronemeyer, the current integration value, which includes real and imaginary components, is noncoherently combined with any previous integration values. Before the integration values are combined, their magnitude is determined by taking the sum of the squares of the real and imaginary components. (See column 11, lines 15-24.) In constrast, claim 1 includes a step where coherent integration results are noncoherently combined without regard to phase, and the noncoherent integration step includes multiplying each element (i.e. phasor) of a matrix of correlation results by the complex conjugate of a corresponding element (i.e. phasor) for an immediately preceding signal fragment. Multiplying a phasor by the complex conjugate of another phasor is not the equivalent of the method taught by Gronemeyer. Therefore, claim 1 would not have been obvious to one of ordinary skill in the art based on the teachings of Gronemeyer.

I. Claim 1 does not include a step where a phasor is multiplied by its own complex conjugate

It is respectfully submitted that the Office action's rejection of claim 1 is based on the misunderstanding that claim 1 involves multiplying a phasor by its complex conjugate to find its magnitude. Claim 1 requires that each element (i.e. phasor) is mutiplied by the complex conjugate of a corresponding element (i.e. phasor) for an immediately proceding signal fragment. The use of "corresponding" and "immediately proceding" signify that a phasor is not multiplied with its own complex conjugate. (See Application 16, lines 24-25 stating: "multiplying each input by the complex conjugate of its neighbor.") Therefore, the multiplication step of claim 1 is not the mathematical equivalent of the sum of the squares of the real and imaginary components.

II. Gronemeyer does not teach a step where a phasor is multiplied by the complex conjugate of another phasor

It is respectfully submitted that it does not matter that Gronemeyer may teach non-coherent integration of any previous integration values obtained, because this is not the same as a step involving multiplication of a phasor by the complex conjugate of a corresponding phasor for an immediately preceding signal fragment. The language referred to by the Office action from Gronemeyer merely states which integration values are combined, not the step used to determine the magnitude of an integration value. Claim 1 discloses an additional step within the noncoherent integration step, where a first phasor is multiplied by the complex conjugate of a second phasor, not its own complex conjugate. The second phasor comes from an immediately preceding signal fragment. Therefore, it is respectfully submitted that it makes no difference that Gronemeyer may teach including at least the immediately proceeding correlation result in the non-coherent combination, because Gronemeyer never discloses multiplying a phasor by the complex conjugate of a corresponding phasor for an immediately preceding signal fragment.

The sum of the squares of the real and imaginary components of a phasor, as taught by Gronemeyer, results in a real number. In contrast, the method of claim 1 results in a product that has both an imaginary and real part. (See Application page 16, lines 26-28.) An imaginary and real part of the product is generated, because the phasor of a matrix of correlation results is multiplied by the complex conjugate of a corresponding phasor for an immediately preceding signal fragment. The equation used to represent the multiplication step is found it the specification:

$$(a_n + jb_n)\bullet(a_{n-1} - jb_{n-1})$$

Where a_{n-1} and b_{n-1} represent the real and imaginary components, respectfully, of a corresponding phasor from an immediately proceding signal fragment to the phasor $a_n + jb_n$. The equation

demonstrates that claim 1 includes a multiplication step where a first phasor is multiplied by the complex conjugate of a second phasor, not the first phasor's own complex conjugate. The method of claim 1 (multiplication of a phasor by complex conjugate of another phasor) is not the equivalent of the method taught by Gronemeyer (sum of squares of real and imaginary components). Therefore, claim 1 is not obvious to one skilled in the art based on the teachings of Gronemeyer, because a prior art reference must teach or suggest all of the claim limitations.

In view of the fact that independent claim 1 includes a step that is not the equivalent of the steps taught by Gronemeyer, applicant respectfully requests that the rejections under 35 USC § 103 of claims 1, 6 and 11 be withdrawn, and that the rejections of the other claims remaining in the application also be withdrawn, in view of their dependencies and because their rejections are based on the rejection of one or another of claims 1, 6 and 11.

Conclusion

All of the claims remaining in the application are now in condition for allowance and their passage to issue is earnestly solicited.

Respectfully submitted,

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